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(9759/3)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Kirby et al.		
APPLICATION NO.	10/622,372	ART UNIT:	Not yet assigned
FILING DATE:	July 18, 2003	EXAMINER:	Not yet assigned
TITLE:	Methods and Apparatus for an Interactive Media Display		

CERTIFICATE OF FIRST CLASS MAILING UNDER 37 C.F.R. 1.8

I hereby certify that this correspondence, and any document(s) referred to as enclosed herein, is/are being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 29th day of October, 2003.

Irja Zarembok

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Submitted herewith are:

Transmittal Form (1 pg.);
Priority Claim and Submission of Priority Document (1 pg.);
Certified copy of Irish Short-Term Patent Application No. S2002/0605 (29 pgs.); and
Return receipt postcard.

2700541

TRANSMITTAL FORM

Application Serial Number	10/622,372
Filing Date	July 18, 2003
First Named Inventor	Kirby
Group Art Unit	2673
Examiner Name	Not Yet Assigned
Attorney Docket No.	ITS-001
BATCH NO. (after allowance)	Not Applicable
Patent No.	Not Applicable
Issue Date	Not Applicable

ENCLOSURES ***(check all that apply)***

- ☐ Fee Transmittal Form
  - ☐ Check Attached
  - ☐ Copy of Fee Transmittal Form
- ☐ Amendment/Response
  - ☐ Preliminary
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
  - ☐ Letter to Official Draftsperson Including Drawings [Total Sheets _____]
- ☐ Petition for Extension of Time
- ☐ Information Disclosure Statement
  - ☐ Copy of IDS Citation
  - ☐ PTO-1449 Form
- ☐ Certified Copy of Priority Document(s)
- ☐ Sequence Listing submission
  - ☐ Paper Copy/CD
  - ☐ Computer Readable Copy
  - ☐ Statement verifying identity of above
- ☐ Copy of Notice to File Missing Parts of Application (PTO-1553)
- ☐ Formal Drawing(s)
- ☐ Request For Continued Examination (RCE) Transmittal
- ☐ Power of Attorney (Revocation of Prior Powers)
- ☐ Terminal Disclaimer
- ☐ Executed Declaration and Power of Attorney for Utility or Design Patent Application
- ☐ Small Entity Statement
- ☐ CD(s) for large table or computer program
- ☐ Amendment After Allowance
- ☐ Request for Certificate of Correction
  - ☐ Certificate of Correction (in duplicate)
- ☐ Notice of Appeal to Board of Patent Appeals and Interferences
- ☐ Appeal Brief (in triplicate)
- ☐ Status Inquiry
- ☒ Return Receipt Postcard
- ☒ Certificate of First Class Mailing under 37 C.F.R. 1.8
- ☐ Certificate of Facsimile Transmission under 37 C.F.R. 1.8
- ☒ Additional Enclosure(s) *(please identify below)*
  - ☒ Priority Claim and Submission of Priority Document (1 pg.)
  - ☒ Certified copy of Irish Short-Term Patent Application No. S2002/0605 (29 pgs.)

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Respectfully submitted,

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2700545

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRIORITY CLAIM AND SUBMISSION OF PRIORITY DOCUMENT

As filed, the above-referenced application claimed priority to following patent application(s) under 35USC §119:

Country:	Ireland
Application No.:	S2002/0605
Filing Date:	July 19, 2002

Accordingly, a copy of this patent application is enclosed pursuant to PCT Rule 17.1.

Applicants believe that no fees are due with the submission of this paper. However, if any fee is required for this paper or the entry of the certified priority document, please charge any such fees to Deposit Account No. 20-0531.

Respectfully submitted,

Date: October 29, 2003

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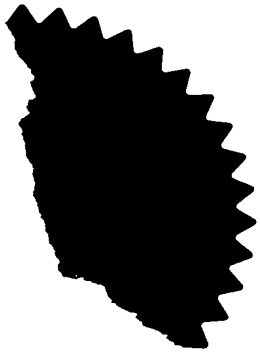
Patents Office
Government Buildings
Hebron Road
Kilkenny

I HEREBY CERTIFY that annexed hereto is a true copy of the documents filed in connection with the following patent application:

Application No.	2002/0605
Date of Filing	19/07/2002
Applicants	Michael F. Lennon, an Irish Citizen of Hillhouse, Torca Road, Dalkey, County Dublin, Ireland Owen Lennon, an Irish citizen of Driftwood, Carrickbrack Road, Sutton, Dublin 13, Ireland Timothy J. Kirby, a British subject of 14 Orlynn Park, Lusk, County Dublin, Ireland John Stanley, an Irish citizen of 1 Abbeycourt, Kinsale, County Cork, Ireland David Walsh-Kemmis, an Irish citizen of Ballykilcavan, Stradbally, County Laois, Ireland Gary Noone, an Irish citizen of 5 Castlegate, Lord Edward Street, Dublin 2, Ireland Jonathan Downey, an Irish citizen of 4 Ashgrove Park, Naas, County Kildare, Ireland Bernard Goldbach, a citizen of the United States of America of 8 Upper Garringreen, Kilkenny, County Kilkenny, Ireland David Grant, an Irish citizen of 53 College Park, Dunshaughlin, County Meath, Ireland



Dated this 30 day of July 2003.

An officer authorised by the
Controller of Patents, Designs and Trademarks.

FORM NO. 1

APPLICATION No. S 0 2 0 6 0 5

Request for the Grant of a Patent

PATENTS ACT, 1992

The Applicant(s) named herein hereby request(s)

☐ the grant of a patent under Part II of the Act

☒ the grant of a short-term patent under Part III of the Act

on the basis of the information furnished hereunder

1. Applicant(s)

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Description/Nationality: (see above)

2. Title of Invention: DISPLAY SYSTEM

3. Declaration of Priority on basis of previously filed application(s) for same invention (Sections 25 & 26)

Previous Filing Date	Country in or for which Filed	Filing No.
.....	.....	.....

4. Identification of Inventor(s)

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5. Statement of right to be granted a patent (Section 17(2)(b))

The Applicants are the Inventors.

6. Items accompanying this Request - tick as appropriate

(i) ☒ prescribed filing fee (€60.00)
(ii) ☐ specification containing a description and claims
☒ specification containing a description only
☒ drawings referred to in description or claims
(iii) ☐ an abstract
(iv) ☐ copy of previous application(s) whose priority is claimed
(v) ☐ translation of previous application whose priority is claimed
(vi) ☐ Authorisation of Agent (this may be given at 8 if this Request is signed by the Applicant(s)

7. Divisional Application(s)

The following information is applicable to the present application which is made under Section 24:-

Earlier Application No. ..... Filing Date .....

8. **Agent**

The following is authorised to act as agent in all proceedings in connection with the obtaining of a patent to which this request relates and in relation to any patent granted:-

MACLACHLAN & DONALDSON, 47 Merrion Square, Dublin 2

9. **Address for Service (if different to that at 8)**

MACLACHLAN & DONALDSON, at their address as recorded for the time being in the Register of Patent Agents (Rule 92)

Signed Name(s) MICHAEL F. LENNON, OWEN LENNON, TIMOTHY J. KIRBY, JOHN STANLEY, DAVID WALSH-KEMMIS, GARY NOONE, JONATHAN DOWNEY, BERNARD GOLDBACH, DAVID GRANT

By .....

MACLACHLAN & DONALDSON, Applicants' Agents

Date: **July 19th 2002**

DISPLAY SYSTEM

This invention relates to a display system. In particular, it relates to a display system upon which information can be displayed in response to a request by user.

Currently, plasma screens or large wall-sized projected displays (referred to generally as "large displays") are one-way communication devices; they are not interactive device. A manager of a large display sets it up in a specific location to display content also set up by the manager. Viewers of the large display have no ability to influence its content directly. A viewer can change the content only through communication with the manager. It should be noted that the term "large display" as used in this specification is intended not limited to any display technology nor any specific minimum size. Although plasma and projection displays are given as examples, other applicable display technologies are in existence and will come into existence in the future, and this invention has equal applicability to such display technologies.

Large displays have the potential to provide a user with a display of content in a range of situations and with visual impact that cannot be met by a conventional computer display screen. In any event, the cost of a large display is beyond the reach of many users.

An aim of this invention is to enable user to remotely control the content displayed on a large display device, for the purpose of seeing requested information in real time.

Another aim of the invention is to provide a remote control device capable of jointly controlling audiovisual systems and electronic device systems.

Another aim of the invention is to provide a method by which a remote control device can receive content onto the mobile phones of users.

At its most general, this invention provides a display system that incorporates a display, a content provision system for providing content to be shown on the display and control means operable by a user to select the content to be displayed.

With this proposed system, viewers would be able to select content to be displayed through use of the control means.

The display mechanism could be an electronic screen or a surface serving as a projection screen. Most typically, it is a large display, as defined above. The display may be in a public place; for example it may be in the form of a sign in or on a public building or in a street (a so-called "intelligent sign").

The control means most typically includes a portable communication device. It may be a device carried by a user. For example, it may be a mobile telephone or an electronic device that has mobile telephony capabilities.

In embodiments optionally in accordance with the last-preceding paragraph, the control means is operable to generate telephone dialling signals (for example, DTMF signals), referred to in this specification by the term "touchtone", to direct operation of the control means. This touchtone device could be a mobile telephone, a landline telephone, or dialling tone-generating apparatus associated with a telephone voice input. Embodiments of this invention could be implemented on other mobile devices where the application functions programmatically and without the use of tones. In such a system, a user can typically select content by activating a set of numbers corresponding to a remote controller and a menu item.

Embodiments of this invention also provide underlying technologies used to aggregate content and to transmit that aggregated content through, for example, the Internet on request to the digital display unit.

Mobile phones and most handheld phones have touchtone capability. A user can press a key on the phone that corresponds to a menu item on a display. Some video display units can be controlled with remote control units, normally using infrared controllers. Effectively, to enable a viewer to change content on a display (e.g. a large display) this invention, in specific embodiments, provides a system has that enables a mobile 'phone handset to function in a manner similar to a television remote control unit. Users can conveniently key in numbers on their 'phone, corresponding to menu numbers displayed on a viewing screen (which may be the display or part of the display or it may be on the 'phone itself). Once the numbers are acknowledged, the system sends appropriate content to the display.

Embodiments of the invention may cause data to be returned to the control means, for example in response to user interaction with the system. When the controller is a mobile 'phone, this data may include, for example, ringtones, WAP content, and other data.

Further, the invention can be considered to provide a browser that displays output on a large display and that can be controlled by a controller such as a mobile telephony device.

Embodiments of the invention incorporate a series of video loops that contain content from advertisers and sponsors. Normally, such content enters a broadcast stream where it is priced at a premium rate. This can include material, such as advertising, that will be displayed when the system is not interacting with a user.

From another aspect, the invention provides a content system in which a user can build a content programme in a remote computer system, for example through interaction with a web page, and subsequently cause that programme to be reproduced on a display system, for example, a system embodying the first aspect of the invention. This may include a programme guide (MPQ) that may be specific to a particular user of the system, optionally in combination with or for use with an embodiment of the first aspect of the invention. A user's MPQ is constituted by a user's aggregated content. The aggregate remains on a remote server until it is requested, queued, transmitted and played on a remote display unit.

This system superposes a program table in a remote database accessible through the Internet over using interactive voice response (IVR). Venues are presented with the relevant program table on their electronic displays and can select desired information.

The world-wide web and other services distributed over the Internet can provide access to content that extends well beyond the local environment in which a display system embodying the invention is located. Because of the vastness of the world-wide web, it is often difficult for a users to find relevant information quickly, if at all. The MPQ sets up a process whereby users nominate desired information for harvesting. A software robot may be employed to harvest information from web sites, returning the harvest for aggregation into the user's MPQ. Summaries of the aggregated information can be available for viewing by users.

According to a further aspect of the invention, there is provided a remote control device comprising:

- a receiver for receiving information on programs transmitted through a transmission line,
- a display for displaying tabulated program information received by the receiver,
- a program reserve information demand portion transferring through the transmission line a command of demanding program reserve information corresponding to desired program information among the tabulated program information displayed on the display, and
- a control signal generator for generating a control signal to control an electronic device in response to the program reserve information demanded by the program reserve information request portion and received at the receiver through the transmission line.

According to another aspect of the invention, there is provided a transmitter-receiver device comprising:

- a transmitter for transmitting tabulated program information in response to a user's demand transmitted from a transmission line and
- a receiver for receiving through the transmission line a demand for program reserve information corresponding to desired program information designated by a user among the tabulated program information, the transmitter transmitting the demanded program reserve information in response to the demand for the program reserve information received by the receiver.

According to another aspect of the invention, there is provided a transmitting and receiving method comprising the steps of:

transmitting tabulated program information in response to a user's demand sent through a telephone transmission;

- receiving the demand for program reserve information corresponding to desired aggregated information designated by the user among the tabulated user profile; and

- transmitting designated aggregated information in response to the display unit's response to the information system.

Another aspect of the invention provides remote control viewing device comprising some or all of:

receiving means for receiving information *via* a network, the information including, for example, pre-selected and/or cached content held on a remote database server that is transmitted on user request to the remote viewing location;

display means for displaying the information, for example, including text, video clips, images and movies in accordance with the user's requests;

selecting means for selecting a desired menu item from the displayed user menu;

determining means for determining remote database content corresponding to the desired menu item selected by the selecting means;

converting means for converting the determined remote database information into a (e.g. wireless) data communication signal for reproduction on an end-user electronic display device;

locker means, being an electronic repository used to hold previously requested content (e.g. corresponding to a plurality of the end-user electronic display devices from various sources); and

transmitting means for transmitting the remote database content converted by the converting means to the end-user electronic viewing device.

The content display may include reserved placeholders on a digital display device with electronically coded keyframes that signal the playing of the programme item, for example, by way of Java servlets or other software objects.

The remote command signal may includes remote control commands constructed as Extensible Markup Language (XML) for at least a start time and a reception channel for the desired content.

The network may be the Internet, may use hypertext transport protocol, and may be used in conjunction with interactive voice response.

The remotely controlled viewing device may further comprise register means for registering remote command signals corresponding to an end-user interactive voice response tone; the converting means converting remote command information from the interactive voice response in accordance with the registered remote command signals.

The remote command information may be based upon a pre-configured programme reservation code previously assigned to each user profile.

The end-user electronic device may be a telephony device (wireless or wired) or any device capable of sending dialling tone codes.

Another aspect of the invention provides a transmitter/receiver device comprising one or more of:

first transmitting means for transmitting user information in response to an XML request *via* a network; the user information including pre-configured user information and remote command information related to a plurality of user viewing options;

receiving means for sending the request for user information and for receiving user information transmitted in response to the request *via* the network;

display means for displaying a programme menu in accordance with received programme information;

selecting means for selecting a desired programme menu from the displayed programme menu;

determining means for determining remotely displayed information corresponding to the desired broadcast programme selected by the selecting means;

converting means for converting the determined remote database information extracts into a remote control signal corresponding to an end-user electronic device;

memory means for previously storing remotely controlled menu requests corresponding to a plurality of the end-user electronic display devices from different manufacturers; and

second transmitting means for transmitting the remote control signal converted by the converting means to the end-user electronic display device.

The menu information may include at least a start time and a placeholder marker for the desired menu item. The transmitter/receiver device may further comprise a general logging module for registering remote command signals corresponding to an end-user electronic device sent over an interactive voice response network; the converting means converting remote command information in accordance with the registered remote command signals.

The remote command information may be based upon a menu item code previously assigned to each item of content.

The end-user electronic device is typically an electronic display unit for viewing the selected data.

Yet a further aspect of the invention provides a transmitting and receiving method comprising one or more of the steps of:

receiving program information via a predetermined network in response to a transmitted demand; the program information including pre-selected information and remote command information related to a plurality of aggregated content;

displaying a selection menu in accordance with the pre-configured display unit;

selecting a desired item from the displayed menu on the display device;

determining remote command information corresponding to the desired display item chosen in the selecting step;

converting the selected remotely aggregated information into a remote control signal corresponding to an end-user electronic display device;

storing remote control signals corresponding to a plurality of the end-user electronic display devices from different manufacturers; and

transmitting the remote control signal converted by the converting means to the end-user electronic display device.

The pre-selected information typically includes at least a queued time and placeholder the desired requested content. Information will be stored as in-memory XML structures.

The method may further comprise a step of registering remote command signals corresponding to an end-user electronic display device; the converting step converting remote command information in accordance with the registered remote command signals.

The predetermined network may be the Internet over which the transmitted data is encoded in hypertext transport protocol (HTTP).

Embodiments of the invention will now be described in detail, by way of example, and with reference to the accompanying drawings, in which:

Figure 1 is a block diagram of the entirety of a network display system embodying the invention;

Figure 2 is a diagram of an intelligent display unit shown in a remote venue connected over the network system to which the invention is applied.

Figure 3 is a screen capture that depicts the three areas of screen content on the intelligent display unit.

Figure 4 is a screen capture that depicts various channels for aggregated content in a content distribution system and behaviours or modes corresponding to these channels;

Figure 5 shows the screen of Figure 3 displayed on an embodiment in the form of a publicly viewable sign;

Figure 6 is a diagram of a screen on which a user can select items from the system locker;

Figure 7 is a block diagram of the entirety of the intelligent display network system, taken as a second embodiment of the invention; and

Figure 8 shows various embodiments of the invention in a range of different configurations.

With reference first to Figure 1, a display system is shown that is an embodiment of the invention. In Figure 1, a user with a mobile 'phone 1 initiates a call to a contact number. Once connected, the 'phone can be used to transmit a DTMF keytone over the GSM network to a mast 2, where the tone signal is further relayed to an interactive voice response (IVR) controller 3.

For example, the IVR controller may offer a user options as follows, each on which gives access to a respective content channel:

1. User sends a command to the Intellisign by pushing keys on a phone
2. Keypad sequence is sent via Interactive Voice Response.
3. IVR sequences will invoke the following submenus
    a. Ringtones
    b. Downloads
    c. News items
    d. Sports
    e. Lifestyle
    f. Games
    g. Irish
    h. Kids
    i. Education
    j. Teen
    k. Financial
    l. Video
    m. Adult
    n. Music
    o. Community Info

These options may also be presented to the user graphically, as shown in Figure 4, to be described below.

The IVR controller 3 processes the tones and passes the result to a user controller 3 by exchanging Extensible Markup Language (XML) code. The user controller 3 directs a local wayport 4 which passes a playlist command to an intelligent display unit 5. The

display unit 5 includes a large display, a plasma display in this case, incorporated into a sign that can be installed for example on a street or in a building. If the display unit 5 requires files or other data for reproduction, it requests that data from a central controller 6. The central controller processes information sent from the IVR Controller.

In this embodiment, the intelligent display unit 5 receives its data and its commands to display specific data through the Internet. The central controller 6 also provides information on system events through the Internet. Thus, users can view selected content not only on the intelligent display unit but also through a web browser.

The user controller includes modules as shown in Table 1 to process data from the IVR controller and the central controller includes modules as shown in Table 2, below.

Table 1

UC 3.1	Module to validate user details
UC 3.2	Module to handle IVR user interactions with the Intellisign
UC 3.3	Module to process SMS request for content display
UC 3.4	Module to process SMS request for ring tone or logo download
UC 3.5	Module to receive new user menu
UC 3.4	Module to receive new sign configuration

Table 2

CC 2.1	Module to construct news feed playlists
CC 2.2	Module to dispatch news feed playlists
CC 3.1	Module to receive initial configuration from Intellisign
CC 3.2	Module to send outgoing commands
CC 3.3	Module to send new configuration details
CC 3.4	Module to acknowledge new configuration details
CC 3.5	Module to send personalised news feed to an Intellisign
CC 3.6	Module to receive details of SMS content download
CC 3.7	Module to receive content display acknowledgement from Intellisign
CC 3.8	Module to receive details of user interactions from Intellisign
CC 4.1	Module to validate user's phone number and send content items to locker controller
CC 4.2	Module to request a job resend, or a ring tone or logo download
CC 4.3	Module to store Zaggie preferences
CC 4.4	Module to receive content information

An example of XML handlers to achieve this is shown in Listing 1, below. This listing shows a sample of XML meta data that is passed between the user controller and the central controller 6. This XML directs the playing of content on the intelligent display unit. These XML handlers are used to decode and display image information, character information and binary control signals that are transferred through a network

An example of an embodiment constructed as a street sign is shown in Figure 5.

In the system according to the invention, commands for selecting behaviours through the use of electronic devices can be provided on web pages in an intelligent locker; that is to say, a web area, illustrated in Figure 6, that is secure and particular to a specific user. By making use of the commands on the locker pages, a user can reserve desired playlists inside the locker web area. These playlists can then be sent over the Internet for display on a local display unit. The information can be transmitted in form of hypertext, and may include substantially any content that can be displayed on a web browser; not only characters but also still or moving images, and sound files as well.

In the system embodying the invention, commands for selecting operation modes of electronic devices are provided on web pages. Users can use these commands to reserve desired playlist activity by confirming content available through the web pages.

A viewer can send content stored in his locker to a display by selecting the appropriate menu item for the display unit. Responsively, the IVR network asks the viewer to indicate whether the locker items should be sent to the intelligent display unit. When the user indicates his intention to migrate locker content to the intelligent display unit, a message on the intelligent sign appears to inform the user of the queued process.

Figure 4 shows an example of content held in locker channels. These channels aggregate thematic content such as news, sports, and financial information. As shown in Figure 4, some of this channel information may be time-sensitive or location-sensitive. For example, the adult channel plays on intelligent display units only after 2200 local time. Bespoke channels can be arranged as private information channels for individual companies.

The relationship between the IVR system and central controller is such that the central controller stores code data (information on codes and carriers) that carriers use for downloading ring tones and graphics. These codes vary from one implementation to another.

As shown diagrammatically in Figure 7, a command initiated on a mobile 'phone for downloading content to the mobile 'phone is sent from the phone to the IVR system and ultimately back to the SMS gateway of the mobile phone network. The command is applied to the central controller via an XML interface. The central controller interprets the commands, and a corresponding code data is read out from the code storage. Output from the code storage portion is supplied to an SMS signal generator, which, in turn, generates an SMS string of the code and carrier determined by the code data.

The process follows these steps:

1. IVR system send a message to the user controller that requests download of a ring tone or logo.
2. The user controller sends the request to the SMS controller.
3. The SMS Controller sends item to the user's phone.
4. The SMS Controller advises the user controller of the download.
5. The user controller advises the central controller of the download.
6. The central controller creates a web-based link to the item that was downloaded.
7. The central controller advises the user controller of the download location.
8. The user controller advises the SMS controller of the user phone number and download location.
9. The SMS Controller sends download location to the user phone number.

Figure 6 shows a locker web page. The locker is an electronic holding point for content viewed during an interaction with an display unit 1 or by a previous interaction with the web. The locker also provides links to most popular downloads 2 and to channels of thematic content 4. Visitors who opt to subscribe to membership will be able to access premium information 3 without paying for each increment.

When using the methods described above, content is transmitted to the display units using Internet services. The schedule of programmed content is renewed from time to time according to pre-booked advertising and entertainment content. The display unit can deliver pre-selected content, such as the ringtones and downloads.

The use of the system is not limited to ringtones, logos or aggregated content. It also can be used as a secure system of information kiosks. Because commands for determining behaviours of electronic devices can be easily made by using hypertexts, this system can be widely used also for other purposes.

In embodiments of the invention, data from a wide cross-section of sources can be optimised and transferred into this system by using Internet technologies. Since the Internet is an international computer network system, the display units can be availed to all areas, using wireless, satellite, wired, and mesh network systems.

A typical interaction with an embodiment of the invention can be described in terms of the following steps:

Step 1. User depresses tone-enabled keypad on telephone in response to a menu system.

Step 2. Tone is received by transmission network.

Step 3. Interactive voice response system decodes the tone and passes relevant details to the user controller.

Step 4. User controller passes a signal to the local wayport. In some embodiments, this data transfer occurs through UDP over the Internet.

Step 5. Local wayport relays UDP signal to venue the local display unit. If venue the display unit requires content, it activates an outbound FTP request. This request may be

relayed through the local wayport or it could be passed directly from the display to the central controller.

Step 6. Upon receiving a valid FTP request, central controller releases requested content and logs the transaction.

Item 1. Intellisign displays content or menu commands for viewers.

From the point of view of the user, this sequence can be summarised as:

1. User sees an intelligent display unit's telephone number and sign number (which may be displayed on the sign)
2. User dials the designated telephone number.
3. The Interactive Voice Response (IVR) unit requests the number of the sign.
4. User inputs the number of the sign.
5. IVR recommends the user depress the keys relating to the menu item.
6. User Controller directs the sign to display menu items.
7. IVR recommends the user watch the sign to continue the transaction.
8. User presses buttons corresponding to those on the sign's menu or menu items spoken by IVR.
9. User reads information on sign, views videos, or downloads items to the mobile phone that are described on the sign.
10. User terminates phone call.
11. User receives SMS listing the URL at which the material viewed on the sign can be viewed online.

In alternative embodiments, the display can be configured to use high speed data, general packet radio service or faster communication technologies. "WiFi" using the IEEE 802.11

standard may be used as protocol for communicating between the display and local wayport. Ethernet connectivity is an option.

An overview of the command and processing messages handles by the system is presented below:

The display units use UDP communication to send all commands across the network. Commands can be sent to the user controller, and to the player controller of any display unit that has registered with the central controller.

On the display units, the command-processing module of the player controller is the main module that deals with user interaction. It consists of an open socket on a defined port of the display unit. Behind this port, a Java class listens for any messages that are sent, and when one is received, this class will parse it, and perform the appropriate action.

All messages to the module are UDP datagrams. Each datagram will contain a code for the command to be performed and any parameters that are required by that command. The reason for this design decision is that UDP connections are much more lightweight, and therefore faster, than their TCP counterparts.

The format of command messages will now be described. A datagram packet simply consists of a number of bytes. For the display unit, the messages will include a command and, if required, associated parameters. The command value will always be contained in the first byte of the datagram, and the parameters will follow.

For each message, there will be a corresponding XML file that will define what bytes correspond to what fields. This XML file will be present at any clients that are sending commands, so that these clients can create correctly formatted messages. The recipient of the command will use the same file to determine which bytes represent which parameters. The system will know which parameters should be attached for each command, and they will then consult the XML file to decide which bytes of the datagram map to these parameters.

The following groups of commands have been defined: System, Configuration, User and Content Commands. System commands are only sent to the display, and will be used to

reboot or shutdown the player controller. Configuration commands are used to tell either the user controller or a display unit that some configuration file has been updated, and that they should contact the central controller to download the latest version of this file. User commands are only sent to a display unit, and contain details of user requests. Finally, content commands are used for coordinating the downloading and viewing of content by users. In this context, content means both video content on the Intelligent Display Units and ring tone or logo content. Examples of these control messages are presented in Listings 2 to 4.

As shown in Figures 5 and 8, Embodiments of the invention may, for example, be deployed:

1. on a portable sign
2. projected onto an outside surface
3. hanging from a rear projected screen
4. in surface transportation
5. on board aircraft

Listing 1

```
<user_menu id="9999">
      [<menu_item id="9999">
            [<sub_menu [option="9999" target="9999"]?
                  [action="zzzzzzz"]?
                  [groups="XtraVision|Aer Rianta"}?
                  [content_format_id="9"content_type_id="9"
code_id="zzzzzz"]?>
            ZZZZ ZZZZ ZZZZ ZZZZ
            </sub_menu>]+
      </menu_item>]+
</user_menu>

<user_menu id="123">

  <menu_item id="0">
      <sub_menu option="1" target="1">
      Press 1 to see a list of all Nokia ring tones
      </sub_menu>
      <sub_menu option="2" target="2">Press 2 to see a list of
Nokia logos</sub_menu>
      <sub_menu option="3" target="3"> action="news_feed"
            groups="Aer Rianta|XtraVision|>
      </sub_menu>
    </menu_item>

    <menu_item id="1">
      <sub_menu option="1" target="4" content_format_id="9"
            content_type_id="9" code_id="zzzzzz">
      Press 1 to download the 'Spiderman' ring tone
      </sub_menu>
      <sub_menu option="2" target="4" content_format_id="9"
            content_type_id="9" code_id="zzzzzz">
Press 2 to download the 'Star Wars II' ring tone
</sub_menu>
</menu_item>

<menu_item id="2">
      <sub_menu option="1" target="5" content_format_id="9"
            content_type_id="9" code_id="zzzzzz">
      Press 1 to download the 'Spiderman' logo
      </sub_menu>
      <sub_menu option="2" target="5" content_format_id="9"
            content_type_id="9" code_id="zzzzzz">
Press 2 to download the 'Star Wars II' logo
</sub_menu>
</menu_item>

</user_menu>
```

Listing 2

Interface CC 2.2 Dispatch News Feed Playlist

```
<?xml version="1.0" encoding="iso-8859-1"?>
<news_playlist id="999999">
      [content id="zzzzzz">
            <headline>ZZZZZ</headline>
            <abstract>ZZZZZ</abstract>
      </content>]+
</news_playlist>
```

Listing 3

Interface PC 2.1 Acknowledge News Feed Playlist

```
<?xml version="1.0" encoding="iso-8859-1"?>
<news_playlist_ack  id="999999/">
```

Listing 4

Interface CC 2.2 Dispatch News Feed Playlist

```
<?xml version="1.0" encoding="iso-8859-1"?>
<news_playlist id="999999">
      [content id="zzzzzz">
            <headline>ZZZZZ</headline>
            <abstract>ZZZZZ</abstract>
      </content>]+
</news_playlist>
```

Interface PC 2.1 Acknowledge News Feed Playlist

```
<?xml version="1.0" encoding="iso-8859-1"?>
<news_playlist_ack  id="999999/">
```

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DUBLIN 2

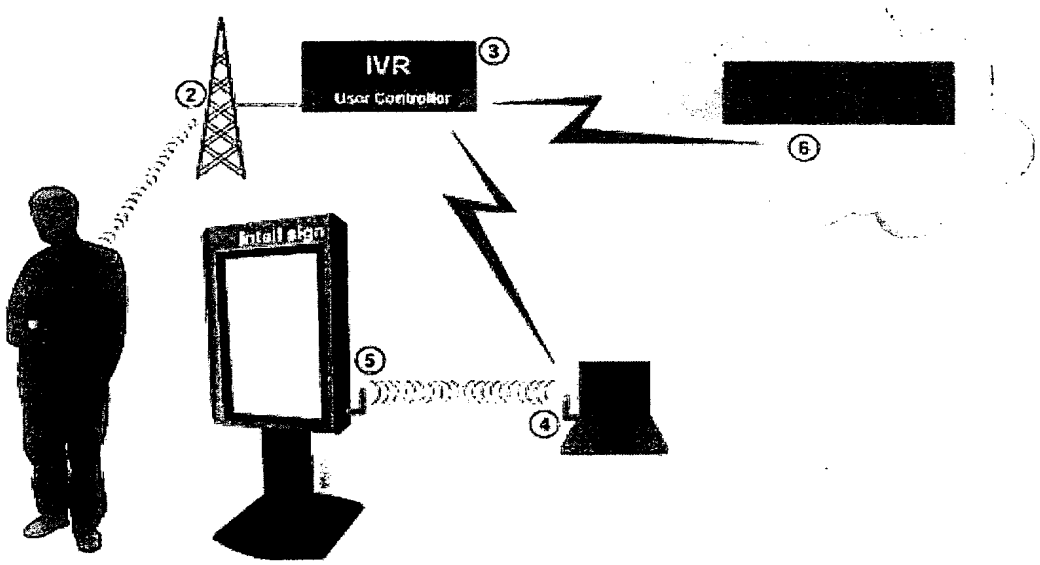


Fig 1

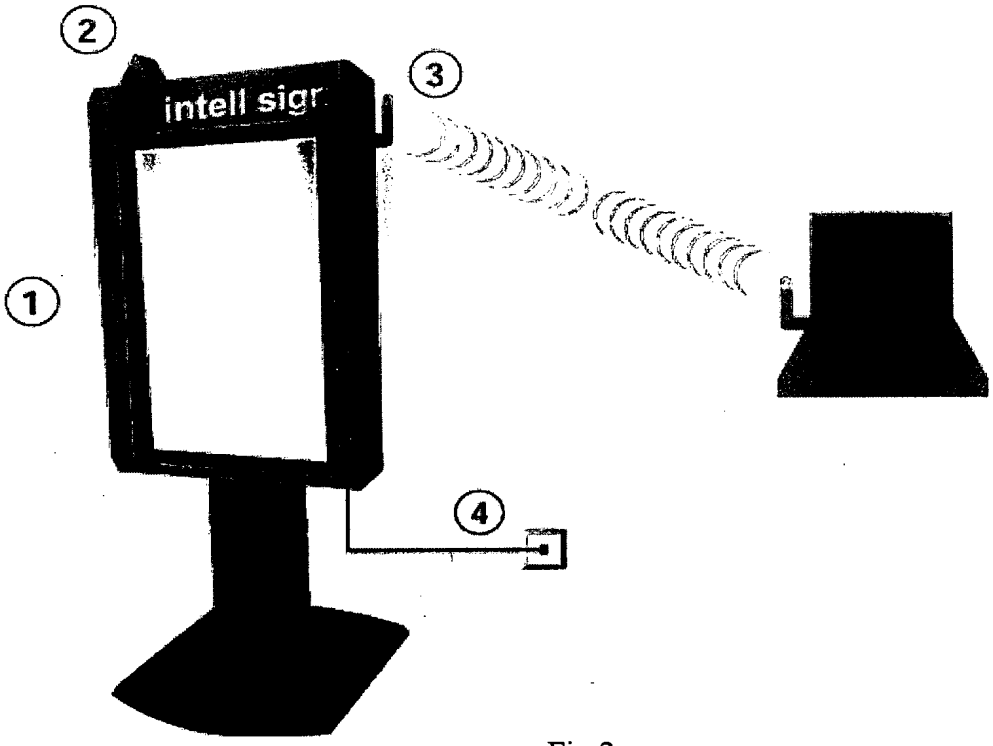


Fig 2

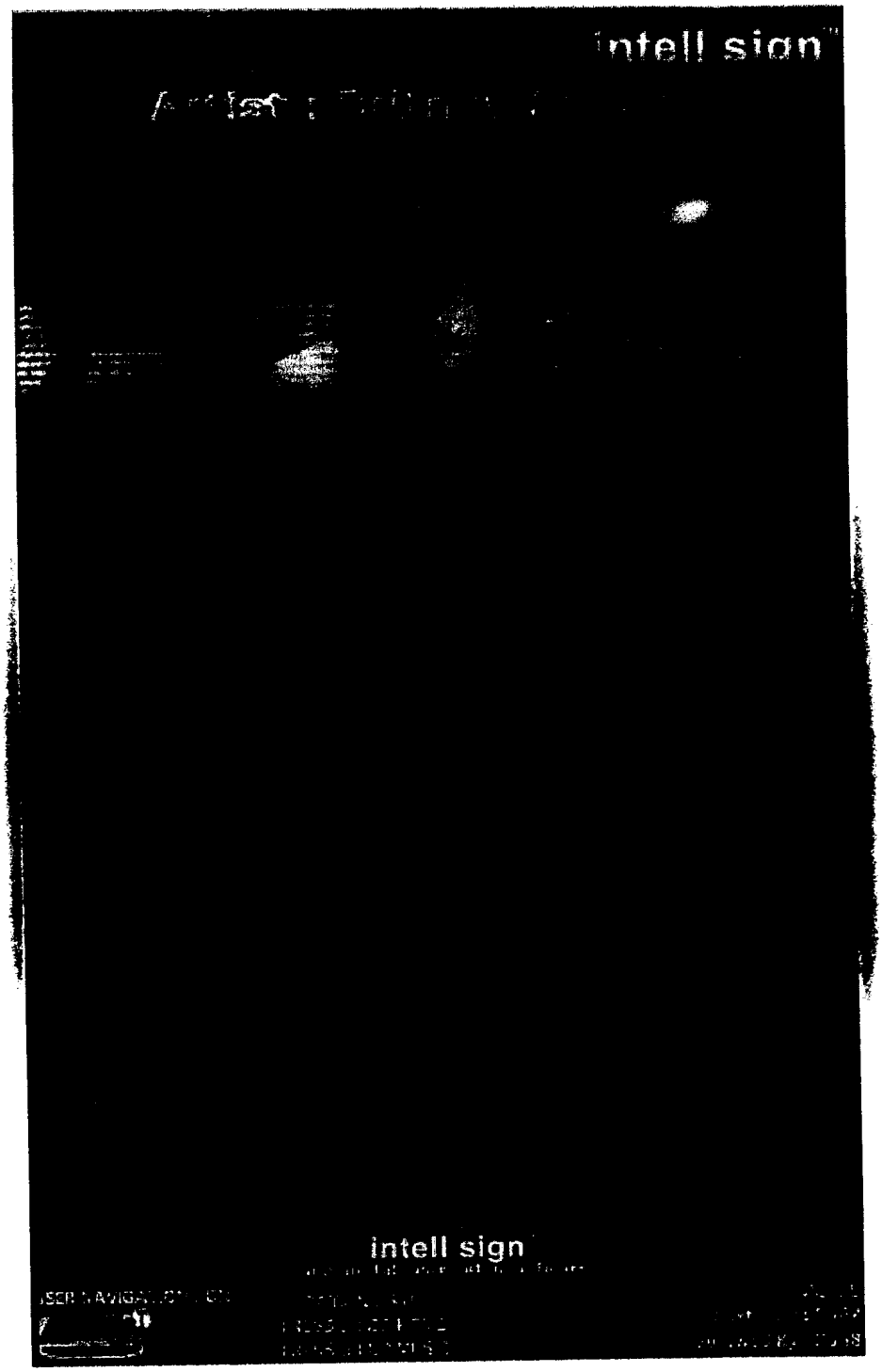


Fig 3

Fig 4

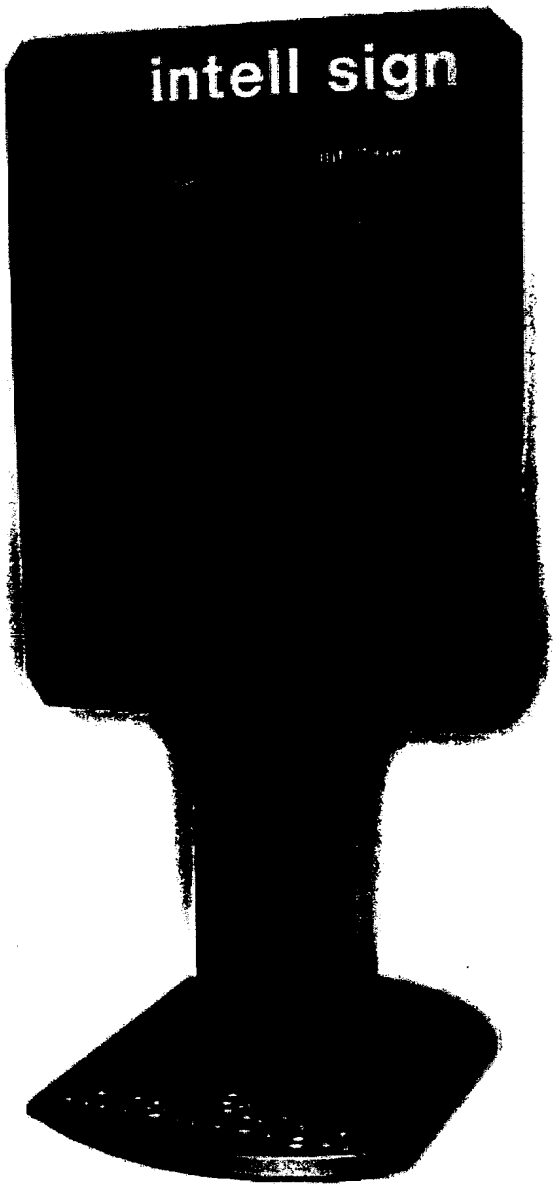


Fig 5

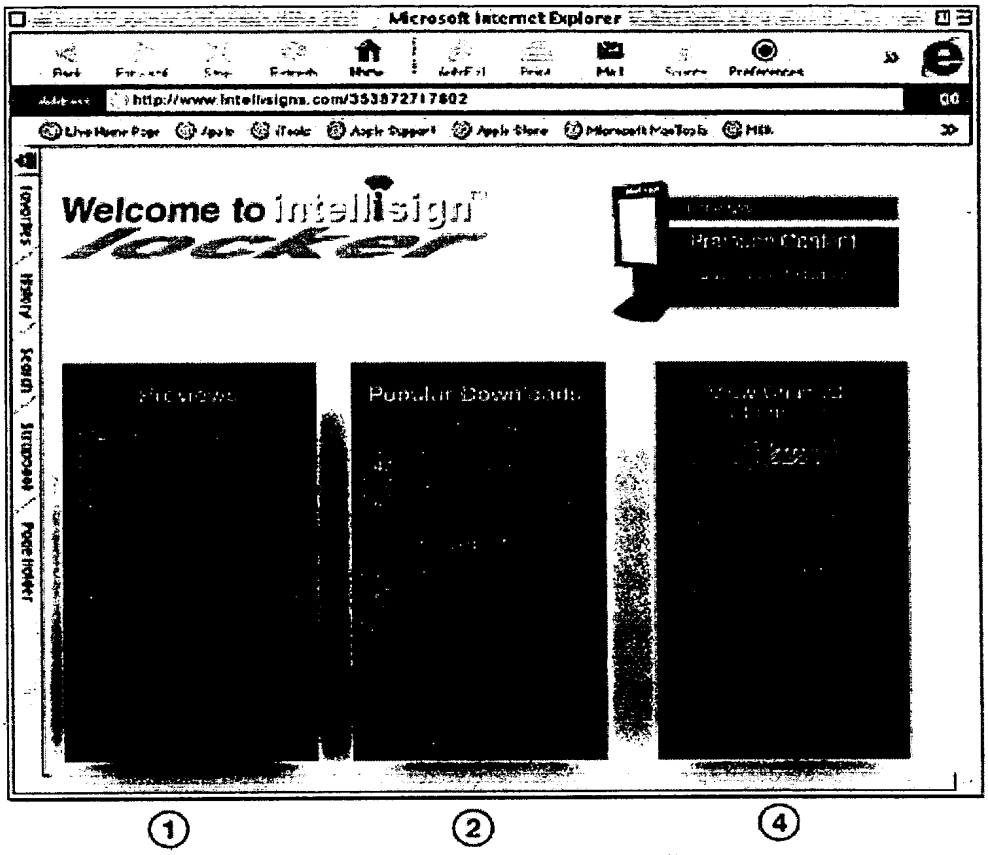

Microsoft Internet Explorer
http://www.intellisigns.com/353872717602
Welcome to IntelliSign
Popular Downloads
3
1
2
4

Fig 6

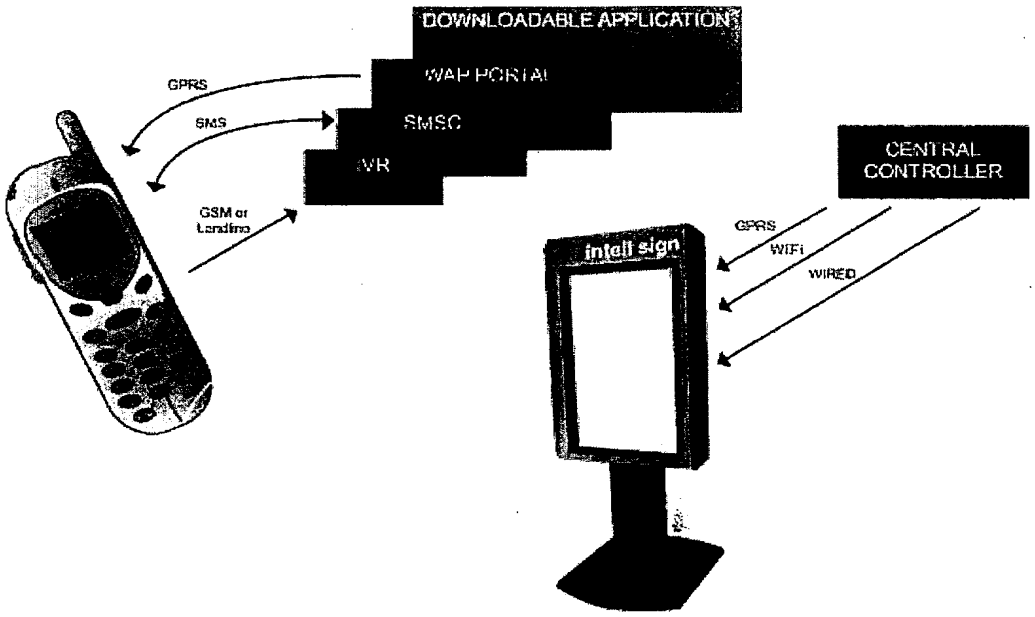
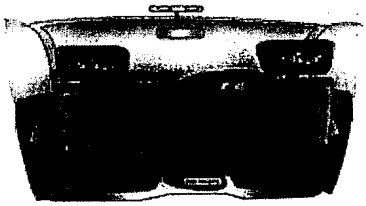
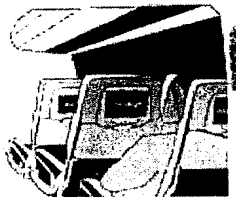


Fig 16. Enhanced Handheld Mobile Control Technology

Fig 7



In headrests and seatbacks of cars.



Aboard aircraft.

Part of a projection system.

Fig 8